CNAP

California-Nevada Climate Applications Program

A NOAA Regional Integrated Sciences and Assessments (RISA) program

Helping Californians Face Drought: Meet the NIDIS Project

Everyone in the West is affected by drought, including water managers, farmers, and the general public. Although drought may appear simple, it is actually rather complex. There are different kinds of drought, with locally varying balances of supply and demand leading to diverse vulnerabilities and substantial differences in information needs between those affected. Developing useful drought information and predictions for this wide-ranging set of clients is a significant challenge.

The National Integrated Drought Information System (NIDIS), with pilot programs across the country, is designed to meet this challenge. The California NIDIS pilot is being led by Dr. Anne Steinemann, a CNAP researcher at the Scripps Institution of Oceanography.

The pilot, which began last year, focuses on four regions where drought has a substantial effect on California's economy and people's lives: (1) ***Southern California***, a complex urban setting that relies heavily on imported water; (2) ***The Russian River***, draining Sonoma and Mendocino counties North of the San Francisco Bay region, is subject at various times to hydrologic extremes of deep droughts and water shortages, or winter deluges that can substantially fill a reservoir in short order; (3) ***The Central Valley***, home to a significant part of the entire country's agriculture, but dependent on imported or ground water during the summer; (4) ***The Klamath Basin*** at the California-Oregon border, a complex water system that must simultaneously serve the needs of farmers, fishermen, tribes, and the environment.

To date, the California pilot project has held over a dozen meetings across the state, engaging more than one hundred stakeholders in this important effort. The project has identified concrete ways that NIDIS can help decision-makers reduce the damaging

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The Great Basin Climate Forums: Climate Information for Stakeholders

Exchanging climate information and ideas with stakeholders is a key aspect of CNAP. We often find that the main area of interest for stakeholders is seasonal variability and climate outlooks, covering a time frame that is of important practical concern to many water and environmental managers in the western United States.

CNAP, in partnership with the Desert Research Institute and Great Basin Landscape Conservation Cooperative, has launched a series of targeted forums focused on bringing climate information to local and regional managers and decision makers. So far, forums have been held in Reno, NV (Spring and Fall 2012) and Klamath Falls, OR (Fall 2012). Upcoming forums are scheduled for Reno and a location in the southern Great Basin. Attendance has been good, with typically 60-100 people who come from a variety of institutions, agencies, and areas of employment.

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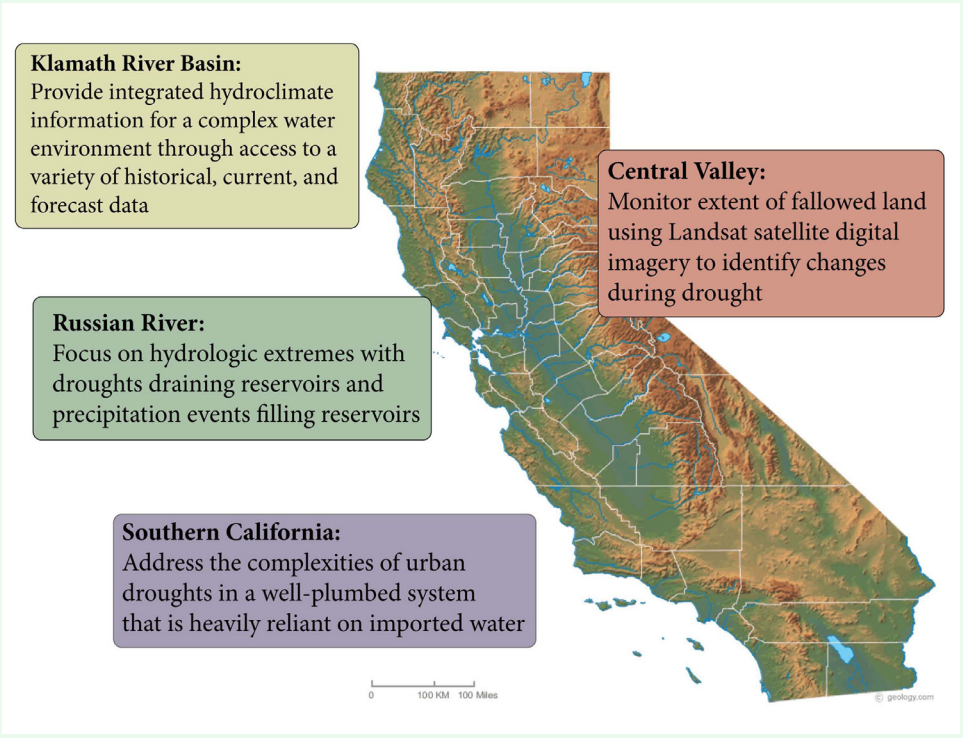
Facing California Drought: the NIDIS Project (continued)

impacts of droughts. Participants have expressed enthusiasm for NIDIS and the value of the early drought warming information that NIDIS can provide.

For instance, in the ***Southern California*** pilot activity, a working group is focused on the design and development of an experimental drought monitoring product relevant to water agencies and users in the region, which is characterized by heavily engineered, regulated, and imported as well as unmanaged water supplies. This would include not only indicators of climate and hydrometeorology, but also regulatory, economic, water supply, water demand, water quality, and impact-based information. The appeal is that it would offer "one stop shopping" for a range of indicators, all in one place, with options to customize the type, format, and scale of the indicators. Water agency managers have expressed a high desire and need for this type of information.

The ***Russian River*** pilot activity has identified the concept of extremes as the key factor that will guide the decisions regarding drought preparation, education, and resource management. Because the region relies on two major reservoirs for water supply and is obligated to maintain environmental flows for fisheries, drought is largely defined by the reservoir in the upper watershed, Lake Mendocino. The region is comprised of numerous and varied stakeholders and a large part of a successful NIDIS implementation will involve defining indicators and triggers, early warning criteria, community involvement, and education.



The ***Central Valley*** pilot activity is developing a way to monitor fallowed land in the Central Valley, a rich agricultural region. Monthly county tabulations, maps, and GIS files are derived from automated processing of Landsat satellite imagery. Such a capability will identify the extent of changes in fallowed acreage due to water shortage during drought. Shortage of water for irrigation and crop production is a principal impact of drought in the Central Valley, and this Pilot Activity will provide a source of timely, objective information on the extent of fallowed acreage to guide decision making, such as for local water transfers, county drought disaster designations, or state emergency proclamations.

The ***Klamath Basin*** has a great diversity of economic, cultural, hydrologic, biological, and climatic settings in a two-state region connected from upper to lower elevations by salmon. An initial approach under development is to provide access to a variety of physical measurements through a single tool that provides historical, current, and future information. The Klamath Basin Pilot Activity will also link to ongoing NOAA efforts to assess the content, usability, and actual use of such tools in decisions made by parties in the basin.

The next phases of the California Pilot will pursue the development of these information products, their implementation and evaluation with stakeholders, and their extension and applicability to other areas. Importantly, this Pilot is expected to generate, transfer, and institutionalize new resources that can be useful to the rest of the nation.

San Diego NIDIS meeting, Sep. 24, 2013.

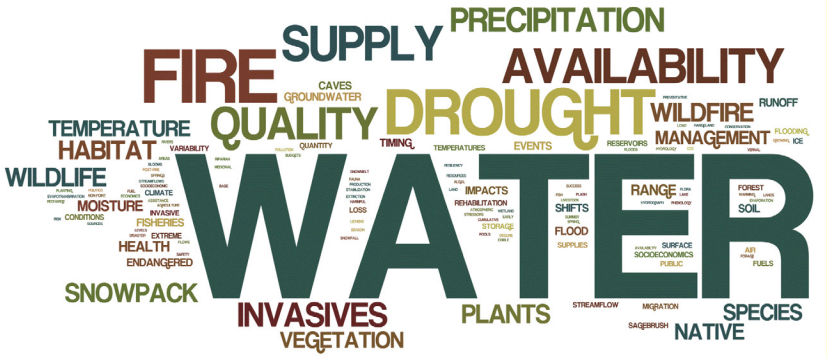
The California NIDIS project is being led by CNAP researcher Dr. Anne Steinemann at the Scripps Institution of Oceanography.

The Great Basin Climate Forums (continued)

The initial focus of the forums is to highlight topics and discussions summarizing the current climate conditions and seasonal outlooks in the Great Basins. One of the goals is to provide resource managers timely and relevant information about current climate conditions and to support near term management decisions. The presentations are recorded and are available on the web for those not able to participate in person.

The climate information presented in the forums targets current climate status and seasonal climate issues in the region around where the forum is being held, since feedback from participants indicates that there is considerably more leeway to attend an event within a two-hour drive than one farther away. Participants find benefits in being able to meet face-to-face with the providers and developers of the climate information. To try to best enable this two-way communication, the presenters are coached to be attuned to the needs and concerns of the managers they are addressing.

The format of the forums have also been designed to address thee attendees' requirements, rather than simply following a less relevant format borrowed from academia. The forums have fewer formal presentations and more breaks to allow greater personal interaction between the managers and the climate specialists. Participants are asked to fill out an exit survey detailing their thoughts on the forum, and the format has evolved over time in accord with those comments and recommendations.



Areas of interest for participants at the Great Basin Climate Forum in Reno, NV, spring 2013. The size of each word is proportional to how often participants listed it as an area of interest (*figure courtesy Todd Hopkins, Great Basin Landscape Conservation Cooperative*).

The cross-jurisdictional/cross-agency approach has also proved of benefit to the participants, as it provides an opportunity to talk and interact with others with similar climate concerns and needs who otherwise might not be readily accessible.

Exit comments:

"I've been to two forums, and found them both very informative."

"Excellent forum, I learned a lot, and it was well worth my time."

"I will ensure that my agency will participate and attend all future Climate forums and I strongly urge you to continue these forums."

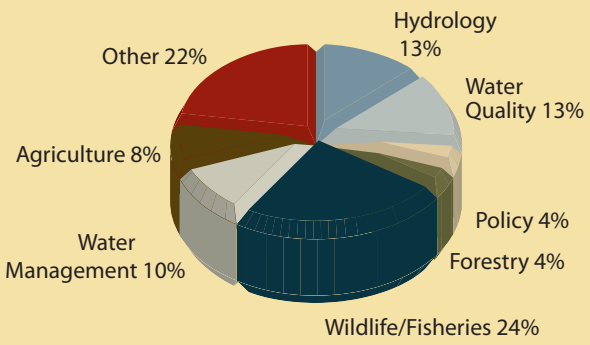
"Beyond the high quality of the presentations, the opportunity for networking was very valuable."

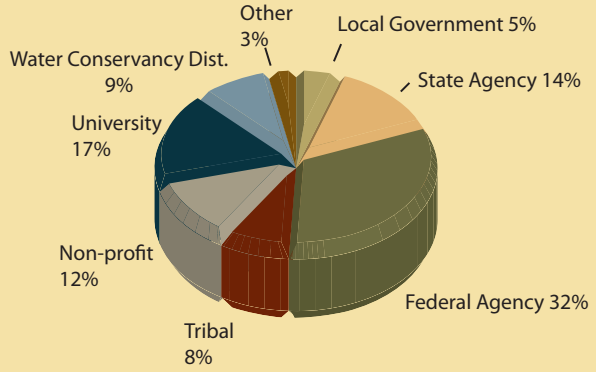
"The ftorum was a great experience to learn about the issues and to connect with other environmental professionals."

"I am always interested in applied climate information and enjoyed the mix of presentations and the afternoon exercise."

Who we're helping: The Great Basin forum participants

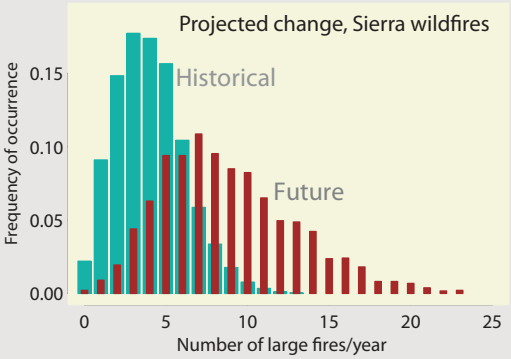
The forums are designed to address needs across traditional agency and jurisdictional boundaries, and the wide-ranging composition of the audiences reflects this. Shown below are the areas of employment (left) and institutional affiliation (right) of the participants at the Spring 2012 forum in Reno, NV. A diverse set of participants contributes to the success of the forums.





Planning for Climate Risk and Uncertainty: The California Climate Extremes Workshop

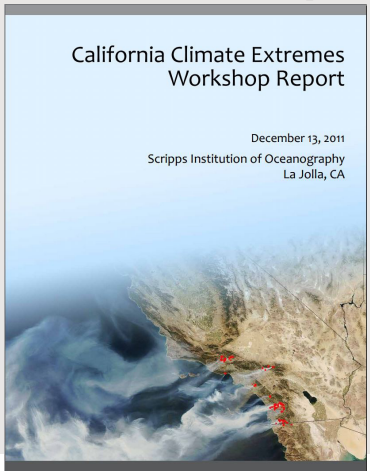
Wildfire, floods, mudslides — it's the climate extremes that have the biggest impact on our lives and economy. Climate scientists have generated substantial amounts of *data* on climate extremes, but local and regional policy-makers have a pressing need for climate *information* that can be used to address practical problems as our region grapples with sea level rise, drought, coastal erosion, higher temperatures, and declining snowpack.



One way to bridge the gap between *data* and *information* is to bring climate scientists and policy makers together so both can better understand the needs and limitations of the other. Nowhere is this more important than when dealing with climate extremes.

In December of 2011, under the lead sponsorship of the CNAP program, local and regional policy makers and climate scientists convened at the Scripps Institution of Oceanography in La Jolla to discuss our current understanding of climate extremes and what information is needed for sensible policy and planning decisions. The format was designed to be flexible, with a mix of presentations, panel discussions, and poster sessions and break times that allowed one-on-one interactions. The event was well attended, with close to one hundred participants from academia, local businesses and non-governmental environmental organizations, and all levels of government from local to state to federal.

The latest scientific results on the effects of climate extremes on our region were shown, including impacts on public health, the economy, transportation system, and communities in locations subject to wildfire. Although these showed that progress is being made in understanding the impact of these events on our lives and livelihoods, discussions indicated that other gaps remain. In particular, correctly describing and understanding uncertainty in the predictions remains an essential topic of research. The workshop report, written in an easily accessible format, is now available from the CNAP web site at cnap.ucsd.edu (see below).



About CNAP

The California Nevada Applications Program (CNAP) develops and provides climate information and forecasts for decision-makers in California and Nevada.

CNAP is one of a network of climate centers across the U.S. sponsored by the NOAA Regional Integrated Sciences and Assessments (RISA) program, which supports research bridging climate science and society. CNAP researchers from California and Nevada collaborate with a range of stakeholders to develop information and tools for climate adaptation. Addressing key societal concerns, CNAP projects focus mainly on water resources, wildfire, and the coasts.

Our Partners

CNAP researchers work with a range of decision-makers, scientists, and stakeholders, from agencies, industries, and organizations, and at the federal, state, regional, and local levels. Recent partnerships include the California Department of Water Resources, Great Basin Landscape Conservation Cooperative, California Energy Commission, Nevada EPSCoR, Western Governors' Association, Native American Environmental Protection Coalition, Metropolitan Water District, San Diego County Water Authority, California Landscape Conservation Cooperative, and the CA Emergency Management Agency.

Contact Us

For more information about CNAP please visit our website:

http://cnap.ucsd.edu

Or contact:

Anne Steinemann
Program Manager, CNAP
e-mail: asteinemann@ucsd.edu

Dan Cayan
Co-Director, CNAP
e-mail: dcayan@ucsd.edu
Scripps Institution of Oceanography,
U.C. San Diego
9500 Gilman Drive, La Jolla, CA
92093-0224